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THESIS

ANALYSIS OF MANAGEMENT TRAINING FOR
THE NAVAL AVIONICS CENTER

by

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December, 1991

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Analysis of Management Training for
the Naval Avionics Center

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ABSTRACT

This thesis addresses the benefits that the employees of the Naval Avionics Center (NAC) believe they are receiving from management training. Specifically, this study determines whether or not the management training that is offered to NAC scientists and engineers is perceived as beneficial. In order to determine the perceptions of the trainees, a questionnaire was developed and distributed to all eligible employees. Fifty-nine percent of the participants responded. The results of the research indicated that the trainees generally had positive responses to all of the survey questions. Based on those results, it is concluded that the scientists and engineers do perceive the training that they are receiving as beneficial. However, due to the small number of surveys returned, the results for the entire study must be considered exploratory.

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I. BACKGROUND

A. NAVAL AVIONICS CENTER

The Naval Avionics Center (NAC), which is located in Indianapolis Indiana, is a non-profit government organization that specializes in the field of aviation electronics, or "avionics." They cater not only to the specific needs of the four American services--the Navy, Marines, Air Force, and Army--but to international customers as well. Their work force consists of over 3400 employees, 34% of which are scientists and engineers. The Center is organized into nine departments. (A basic organization chart is provided as Appendix A.) Four of these departments--department "200" (Manufacturing Technology), "400" (Product Integrity and Assurance), "800" (Systems and Technology), and "900" (Engineering)--are where a majority of the scientists and engineers are located. As civil servants, they are salaried employees who are paid on standard government GS/GM pay scales.

NAC's mission is "To conduct research, development, engineering, material acquisition, pilot and limited manufacturing, technical evaluation, depot maintenance, and integrated logistic support on assigned airborne electronics (avionics), missile, spaceborne, under sea and surface weapon

systems and related equipment." [Ref. 1] With a mission statement as diverse and technically oriented as NAC's, management training becomes an important issue in the development of their engineers.

1. NAC Management Training

NAC management currently spends over ten million dollars annually to offer a variety of training opportunities for their employees. A large portion of the training budget is allocated to management training as can be attested to by the vast number of management courses available to NAC personnel (see Appendix B). During the past couple of years, NAC has been placing increasing emphasis on Deming training, otherwise known as Total Quality Management. The acceptance of this philosophy solidifies NAC's commitment toward training and to the continual learning of their employees.

Instead of NAC employees taking courses piecemeal and without any guidance, NAC management has developed a program called the "Individual Development Plan" (IDP). The IDP is a program that identifies, through both long and short term goals, the employee's desires for training development. If the employee elects to take part in the educational opportunities offered by NAC, then the IDP becomes an annual process by which the employee and the supervisor sit down and try to determine what type of specific training courses would be best for the employee to take. It is up to the individual

employee to decide which general route will be followed--i.e., technical or managerial. Once that decision has been made, the employee and the supervisor meet and try to develop a plan that best fits his/her individual needs.

NAC's current management training program encompasses supervisory training development, management development and executive development. These broad categories can be broken down further to include such generic courses as General Management Skills and Managerial Aspects of Supervision, or courses that are designed to teach more specific skills such as interviewing, negotiating, or appraising performance.

2. Corporate Vision

NAC realizes that its sole purpose for existence is to support the Fleet. In order to maximize the effectiveness of that support NAC has identified its corporate vision: "to be recognized as the leader in avionics and manufacturing excellence." [Ref. 1] To help achieve the corporate vision, The following excerpt from the Center's overview statement describes the importance NAC management places on the continuing education and training of its scientists and engineers:

. . . the center invests in a strong personnel training program designed to foster technical and managerial skills especially attuned to addressing the Navy's airborne electronics issues of today and tomorrow. In order to stay abreast of new philosophies in the systems acquisition process and the rapid advances in avionics

technologies, the Center continually invests in the upgrading of its personnel's capabilities. [Ref. 1]

With this type of philosophy toward training and with the training that is currently being offered, NAC is taking positive steps toward the realization of that vision.

B. PURPOSE AND SCOPE

NAC management is committed to the further development and improvement of their employees. This is demonstrated through their \$10M annual training budget and their continual interest in providing their employees with ample training opportunities. The scientists and engineers at NAC are offered training to further their technical abilities as well as develop their managerial skills. For the purposes of this study, the focus is limited to management training. N A C offers a wide variety of management training courses to their scientists and engineers. This study evaluates the effectiveness of that training from the perspective of the training participants, i.e., the managers or potential managers. "A manager," as defined by R. W. Griffin, "is someone who plans and makes decisions, organizes, leads, and controls human, financial, physical, and information resources, with the aim of achieving organizational goals, in an efficient and effective manner." [Ref. 2] How does a person acquire the skills necessary to become a successful manager? The most common path is through a combination of

experience and proper management training. This training should not only provide for the accomplishment of managers' tasks as outlined above, but it should also be relevant to their jobs, as well as beneficial to themselves and their organization. This study addresses the benefits the people believe they are receiving from management training. Specifically, this study determines whether or not the management training that is offered by NAC to scientists and engineers is perceived as beneficial.

Recently, NAC management requested that the Naval Postgraduate School conduct an evaluation of the return on investment (ROI) of NAC training and this study represents a part of that overall effort. Evaluating management courses is difficult at best. As a result, this effort utilizes perceptions of trainees to assess training outcomes, which can then be reviewed by NAC management to make judgements about the payoff of the training program for the organization.

This study does not address specific cost benefits as that is the purpose of another of the efforts in this program of research. Rather, the issue of interest is the perceived outcomes of specific courses.

C. RESEARCH QUESTIONS

The primary research objective addressed in this thesis is whether or not specific management courses are perceived as useful by NAC scientists and engineers. To accomplish the

research objective, the following specific research questions about training outcomes are addressed:

1. How relevant is management training to job requirements according to trainees?
2. How satisfied are trainees with specific management courses?
3. What is the perceived relationship between management training received and changes in job performance?
4. What are the potential benefits of the management training for the NAC organization?

The assessments can be used in conjunction with other studies to provide NAC management with a basis on which to evaluate its return on investment for training.

D. ORGANIZATION OF THE THESIS

This thesis is divided into five chapters and three appendices. This chapter is followed by Chapter II, which is a review of the literature that is pertinent to the research. Chapter III provides the data base for this research and discusses the method used for the development and administration of the questionnaire. Chapters IV and V provide the results and conclusions, respectively, from the analysis of the questionnaire data. Chapter V also includes recommendations for NAC management training. The Appendices consist of NAC's organizational chart, the list of management courses available, and the questionnaire used for this study.

II. LITERATURE REVIEW

A. MANAGEMENT TRAINING

1. Introduction

"No resource is more critical to the success of an organization than management talent. And no resource is more scarce. Effective managers are made, not born." [Ref. 3] For effective managers to be "made," some form of training must be implemented. William Thomas, author of "Training and Development Do Make Better Managers," [Ref. 4] says that:

"The success of any kind of education or training is difficult to measure. Companies that invest time and money in developing their managers often see improvements in overall company performance. However, unlike manufactured products, good managers cannot be mass produced. It is the combination of personality, instinct, on-the-job experience, good mentoring, solid educational background, decision-making ability, and luck that makes a good manager."

Thomas goes on to say that most successful large companies, companies like IBM, Walt Disney Productions, GE, and Dana Corporation, provide their managers with "educational luxuries." These luxuries include job rotation, succession planning, individual coaching, and, usually, sophisticated in-house training programs. Peters and Waterman in their book, "In Search of Excellence," identified 71 companies that they felt were the most successful in the country. Thomas

conducted a study of those companies and found that 97% have their own in-house management development programs, 96% pay for their managers to take courses in management from local colleges and universities, and almost half of those companies, 43%, grant time off for study leave. [Ref. 4, p. 53]

Through his study, Thomas further concluded that of those companies offering management development courses, 94% provided their own training staffs. By using their own personnel as instructors, the company's "corporate culture" can be transmitted to the managers and supervisors of the future. [Ref. 4, p. 53] Corporate culture is an important element to convey because it instills within the recipient a sense of pride and commitment to the organization.

Lastly, Thomas states that "Management education is cost effective only if you think it is. Its payoff lies in the future. It is an investment in the capital resource of leadership, of providing educational breadth to enable a person to achieve managerial depth." [Ref. 4, p. 53] It is hoped that through the investment in training, successful managers are made. As stated previously though, being successful is the combination of personality, instinct, on-the-job experience, good mentoring, solid educational background, decision-making ability, and luck. However, if a continuing and sound educational/training program is implemented it can go a long way toward making successful managers.

2. Management Training in The Workplace

a. In-House Training

With jobs in today's workforce becoming increasingly more complex, there is greater concern over whether the education and training received by the workers will fulfill the requirements needed for them to function successfully in their chosen fields. According to Donald Kirkpatrick, an organization can improve its supervisors' performance through proper training. He states that there are three major in-house approaches for training and developing supervisors: selected reading, on-the-job coaching, and classroom programs [Ref. 5].

(1) Selected Reading

This is probably the most difficult of the three to accomplish because encouraging supervisors to learn through reading is not an easy task. It requires books or articles that are easy to read and readily accessible, but there must be some motivational factor built into the reading program. [Ref. 5, p. 52] The reading material should cover topics such as leadership, motivation, communication, decision making and problem solving, time management, and subordinate training. To stimulate participation and to motivate supervisors to read, the training/personnel department, as well as higher-level managers should also become involved in the program. This involvement can consist of (1) asking

supervisors to read certain books, then leading them in a book discussion; (2) discussing what was read in the book and how it could be applied to the workforce; and (3) having supervisors read chapters of a book and present a summary to each other. [Ref. 5, p. 52]

(2) On-The-Job Coaching

"On the job training takes place all the time: Managers are always training subordinates by setting examples. Training by example is one of the most powerful training techniques; coaching reinforces it." [Ref. 5 p. 52]

In their every day job, managers coach supervisors in a number of ways: (1) by correcting mistakes, (2) through positive reinforcement, and (3) by completing the employees formal performance appraisal. To become more effective at appraising an employee's performance or conducting proper coaching procedures, Kirkpatrick recommends the following steps:

- Clarify what is expected of the employee.
- Tell the employee how he/she is doing.
- Select one or more performance areas in which the employee needs to improve.
- Develop a performance improvement plan.
- Coach to implement the plan.

Managers should be schooled in the proper principles and techniques of coaching in order to get the most out of their employees.

(3) Classroom Programs

If a company is large enough, classroom programs should be conducted in-house. The term "in-house" doesn't necessarily mean that the program takes place on the company premises. It simply means that attendance is restricted to managers from one organization. The main advantage of in-house programs is that the course or courses being taught can be structured to meet the specific needs of the organization. Parry and Robinson [Ref. 3, pp. 8-13] describe classroom programs that are run by outside organizations as taking the Johnny Appleseed approach. "If you scatter enough seed on enough ground, some will take root and produce." Programs are offered by outside organizations such as colleges and universities, the American Management Association, and trade associations. In creating a good in-house training program, Kirkpatrick identified three phases that must be followed: planning, conducting, and evaluating. [Ref. 5 p. 54] See Table 1 for an outline of the characteristics that help to make a good in-house training program. In-house programs can develop, within the employee, the attitudes that the organization wants. If set up properly, the supervisor's knowledge will increase and his or her skills will improve.

This same point is made again by Anthony P. Carnevale. Management training for middle managers is common

TABLE 1

GOOD IN-HOUSE TRAINING PROGRAMS

PLANNING			
Objective	Subject Content	Schedule	Location
Based on needs Stated in terms of expected outcomes Learner-oriented Clear to everyone	Based on objectives Understandable to learner Pertinent to learner Of benefit to learner	Convenient to learner Proper length Proper frequency	Adequate facilities Minimum interruptions
CONDUCTING			
Leaders	Methods	Aids	
Knowledgeable in subject Interested in teaching Respected by learners Skilled in communicating Skilled in teaching	Varied Maintain learner interest Get group involvement Help learners learn	Audio Video Simple Minimum cost Help learners learn	
EVALUATING			
Reaction	Learning	Behavior	Results
How well did learners like the course?	To what extent did participants learn facts, principles, skills and attitudes?	To what extent did job behavior change because of the course?	What final results were achieved?

in American companies. Although new managers usually start with a good educational base, they often have little training in motivating and managing people. Consequently, as they move from their areas of technical expertise and begin to take on the responsibilities of coordinating resources and people, they usually find that their managerial skills are lacking. To alleviate this problem, American employers try to "make" managers through an extensive employer-provided training programs, including on-the-job training and mentoring.

[Ref. 6]

b. Costs/Effects of Training

In a 1984 survey focusing on formal employer-sponsored training, Carnevale and Garner estimated that employers spent approximately \$30 billion in direct costs for formal training during that same year. [Ref. 7] This is consistent with another 1984 survey in which similar figures were obtained. [Ref. 8]

Barron and Black took the above study and went one step further. Instead of looking at training costs, they wanted to take a look at the effects of training on employment, i.e., productivity and wages. What they concluded was that a 10 percent increase in the amount of time devoted to training was associated with an average 3 percent increase in productivity and a 1.5 percent increase in wages. [Ref. 9]

After evaluating the above mentioned studies, Gary Becker, in his article "What We Do and Don't Know About Training in the Workplace," [Ref. 10] concluded that there are some issues concerning training that are consistent from one company to another. These consistencies include:

- The likelihood of receiving training declines with age.
- The likelihood of receiving training increases with education.
- Men are more likely to receive training.
- Most training is informal.

In addition to finding out what we know about training, Becker also found out what we do not know:

- We have no universal definition of training.
- It is unclear how to measure whether training is successful.
- Changes in training over time are unknown.

3. The Future of Management Training

a. Increased Management Personnel

"In the future there will be more management and more managers." [Ref. 6, p. 21] Anthony Carnevale believes this because, as seen over the past decade, a majority of the jobs in today's organizations that require less skill have been replaced by jobs using sophisticated technology, which require more highly skilled employees. According to the Bureau of Labor Statistics, between now and the year 2000 the number of managers, professionals, and marketing personnel will increase by more than 30 percent. The number of management jobs is expected to increase by three million, more than one and a half times the rate of increase in other occupations. [Ref. 11] The question is this, will management training have to change in order to keep pace with the increasing changes in technology?

b. Changes in Training

David Burgoyne, author of "Management Development Programs: Then and Now," answers the above question in the negative. According to Burgoyne, "Although the changes

businesses experience in the next few decades may be massive, the role of management development programs will be a static one: to prepare managers to handle change and challenges more effectively." [Ref. 12]

One of the best places for a new manager to learn how to perform many of the necessary management skills is on the job. Skills such as leadership, communication, interpersonal effectiveness, teamwork, negotiation, learning, counseling, and teaching are difficult to teach in school but through applied learning, are easy to teach on the job. This does not mean however, that we should leave the development of new managers to the accidents of experience. American companies are better at providing applied learning than the schools. The first challenge employers must face is the difficult task of teaching the schools a more applied approach to management education and to encourage the schools to add curriculum in the "soft" skill areas. It will not be enough for the organizations to duplicate the academic curriculums, they must add the applied dimension to their training to be effective. [Ref. 6, p. 28]

Hawkins and Barclay describe the changes in technology as "extremely complex, inter-disciplinary based and constantly evolving, through radical and refining changes, in response to the needs of the business." [Ref. 13] These changes in technology have changed the nature of management within manufacturing companies. Hawkins and

Barclay refer to these changes as the old and new orders of management. Table 2 summarizes the differences between the "Old and New" orders.

TABLE 2
OLD AND NEW ORDERS OF MANAGEMENT

Old Order	New Order
Production oriented Efficiency based Authoritarian Stable structures Functionally based	Market oriented Entrepreneur based "Co-operative" Changing structures Inter-disciplinary teams

As can be seen from the table, the main difference between the two is that the new order of management is focused more toward controlling risk and increasing responsiveness to the customer.

In addition to these differences in management, engineers must change also. Engineers of the future must be "commercial engineers" with skills such as: contract negotiating and closing, selling and marketing, and persuasion and leadership qualities. The Finniston Report [Ref. 14], agrees with Hawkins and Barclay in stressing the need for future engineers to acquire and use these commercial skills. In order for tomorrow's engineers to become proficient under the "new order" style of management, it is essential that they learn and practice the commercially based skills. In a survey conducted by Hawkins and Barclay

[Ref. 13, p. 50], employers were asked what qualities were considered most important when promoting engineering graduates to management positions. The responses are shown in Table 3.

TABLE 3
FACTORS CONSIDERED FOR MANAGEMENT PROMOTION

Factor	Percentage Rating
People Management	95
Communication Skills	90
Track Record	89
Interpersonal Skills	87
Technical Awareness	85
Project Leadership	84
Personality	83
Profit/Efficiency	80
Innovative Skills	77
Training Undergone	68

As can be seen from the table, people-related skills are considered to be among the most important, whereas innovative type skills were lower on the list.

Another factor to be considered when implementing training is the importance of timing. If management training is given too early in an individual's career it will be difficult for them to understand some of the concepts and ideas. On the other hand, if management training is given too late, when the individual already has a large staff, there is little chance to experiment in developing one's own management style. The balance between being there long enough and not being there too long must be found. According to Hawkins and

Barclay, this balance can be found "when the individual is in charge of a small number of people." It is at this time that the new managers are more peer oriented and have more support from their peers, allowing them to experiment with the new knowledge, skills, attitudes, and behavior that they've attained. [Ref 13, p. 50]

The last point to be brought up about management training is that in the year 2000 it is estimated that, of a company's current workforce, 70 percent of that workforce will be employed by the same company for whom they currently work. This implies that in order to ensure adequate numbers of potential managers, attention must be given to developing the existing personnel. [Ref. 13, p. 54]

4. SUMMARY

This section has provided an overview on management training. The first subject referred to was in-house training. It was determined that organizations, through proper in-house training, can develop within their employees the desired attitudes, culture, and techniques needed to accomplish their routine day-to-day tasks. However, for the in-house training program to be effective, three phases should be followed: planning, conducting, and evaluating. In-house training, according to Donald Kirkpatrick, can consist of: reading programs, on-the-job coaching, and classroom programs.

The second subject referred to was the future of management training. It was pointed out that management development programs are moving away from the technical/innovative aspect of training and toward a more people-oriented type of training. Until the schools can be taught to teach these kind of "soft" skills, more importance will be placed on in-house training.

With more importance being given to in-house training, more attention will have to be given toward evaluating those courses.

B. EVALUATION OF TRAINING

1. Evaluation Measures

Training directors need to know if the employees are learning from the training they are receiving. If they are learning, the training directors need to know if the employees are applying it to their jobs. The bottom line is this; is the organization receiving an equitable return on its training investment? To find out, training or development programs should be evaluated. There are two basic kinds of evaluation measures: those collected in or at the end of training and actual performance measures collected when the trainee has returned to the job. The former are easier to get but the latter are more valid. Trainees may say that they enjoyed the training and learned a lot, but the true test is whether their

job performance is better after their training than before.
[Ref. 1, p. 364]

2. Criteria used to Measure Training

The goal of training evaluation is to determine the degree to which the basic relationship between training and job performance is accomplished. In order to determine whether or not training was successful, Kirkpatrick identified four levels of criteria that should be used when evaluating supervisory training programs. They are: reaction, learning, behavior, and results. [Ref. 15] The four criteria will be discussed below to help clarify the meaning of each, their relationship with each other, and the guidelines and procedures for using them.

a. Reaction

Reaction can be defined as how well the trainees liked a particular training program. Evaluation in terms of reaction is the same as measuring the feelings of the participants. It is simply a measurement in determining how satisfied the participants are with the training they have received. When measuring a participant's reaction to training, honest and meaningful answers are desired. To obtain candid responses, the following five guidelines should be followed:

1. Determine what you want to find out.

2. Use a written comment sheet covering those items determined in step one.

3. Design the form so that the reactions can be tabulated and quantified.

4. Encourage the participants to write in additional comments not covered by the questions designed in step three.

5. Obtain honest reactions by making the forms anonymous.

Even after following the above guidelines, there is still no assurance that any learning has taken place because measuring reaction does not include a measurement of learning.

b. Learning

Learning is defined as the extent to which the trainees have learned the information and skills presented during the training course. To establish a procedure for measuring the amount of learning that takes place in a course of instruction, several guidelines should be followed:

1. A before-and-after test should be used to ensure that any learning is a result of the program.

2. The learning should be measured on an objective basis so that quantitative results can be determined.

3. Where practical, a control group, a group not receiving the training, should be compared with the experimental group that receives the training.

These guidelines imply that evaluation in terms of learning is much more difficult than evaluation in terms of reaction.

c. Behavior

Behavior is basically the extent to which on-the-job behavior of the participant has changed as a result of the training received. Robert Katz, a Professor at Dartmouth, wrote an article in 1956 for the Harvard Business Review entitled, "Human Relation Skills Can Be Sharpened." Kirkpatrick [Ref. 16] quotes Katz as saying, "If a person is going to change their job behavior, five basic requirements must exist": 1) They must want to improve, 2) they must recognize their own weaknesses, 3) they must work in a permissive climate, and 4) they must have an opportunity to try out the new ideas. Without these four requirements being met, it will be difficult, if not impossible for the participants to change their job behavior.

How do we prove that their behavior has changed? Kirkpatrick identifies four guidelines that should help:

1. Measure behavior on a before-the-program and after-the-program basis.
2. Allow enough time between the program and the after-the-program evaluation to allow for change in behavior to occur.
3. Get information about the participant from as many sources as possible.
4. If practical, use a control group to compare with the experimental group. This will help to prove that any changes in behavior were due to the program and not to other factors such as salary adjustments, coaching from the boss, or influence from other people inside or outside the organization.

There will be some difficulties associated with the above guidelines. First of all, measuring behavior before the program, step one, is a difficult task. When measuring behavior before the program, the measurement would have to be taken enough times to be sure that it was not only accurate, but that the behavior observed was typical as well. Secondly, concerning step two, how much time between the program and the evaluation is enough time? The time may vary for different people and different types of skills so it may have to be measured several times to be sure that the measurement is accurate. As can be seen, evaluating training programs in terms of on-the-job behavior will be more difficult than measuring either reaction or learning.

d. Results

Results are the outcome of the training program. "It would include such things as improved productivity, better quality, lower costs, meeting deadlines, more competition, reduced accidents, improved morale, lower turnover, and ultimately, more profits or better service." [Ref. 15, p. 6]

Determining what final results were accomplished due to the training program is the most difficult part of evaluating results. There are so many other factors involved that it is frequently impossible to prove that the training program caused the desired result. Again, as with the three previous

criteria, Kirkpatrick has developed the following guidelines to help in evaluating results:

1. Measure the conditions before the program and compare with the conditions after the program.
2. Use control groups to try to eliminate other factors that could have caused changes in the results.

As we look at the evaluation of reaction, learning, behavior, and results, we can see that it is much easier to say that the training program is having a positive effect on the above criteria than it is to prove it. In some cases, proof is impractical and almost impossible to get. If this is the case, what do you do? According to Kirkpatrick, "you shoot for the proof but be satisfied with the evidence." [Ref. 17]

Jackson and Kulp [Ref. 18] suggest that it is better to approximate evaluation than neglect it all together due to its difficulties. For example, if you can't get measures of behaviors and results, then measuring learning, both at the end of the course as well as some time later, is better than doing nothing at all.

3. Evaluation Techniques

In his article, "A Training-Appropriations Process", David L. Hobbs identifies two evaluation techniques: interviews and surveys. [Ref. 19] According to Hobbs, "An advantage of interviews and surveys is their focus

on the individual. Respondents are not reacting to or influenced by the opinions of others. They are more free to express their own ideas and are more candid and specific in their comments. The interviewer or surveyor benefits from having a high level of control over the direction and depth of the inquiry." [Ref. 19, p. 110] Table 4 identifies additional advantages as well as some disadvantages associated with administering a questionnaire. [Ref. 18, p. 28]

TABLE 4
ADVANTAGES AND DISADVANTAGES
OF QUESTIONNAIRES

Advantages	Disadvantages
1. Can usually be administered to a large number of people, with less time, and money than most other strategies.	1. Can obtain only estimates of what people actually think, feel, do, or produce.
2. Ensures that everyone responds to identical questions/directions.	2. Responses may be biased by respondents' desire to present themselves in the best possible light-or to respond in a way that they think will please the author or recipient of the questionnaire.

When using a questionnaire, you must ensure that it is valid and reliable. If the questionnaire measures what it is supposed to measure then it is considered valid and if it measures consistently then it is reliable. To determine if a questionnaire is valid to the area of study, its questions are

compared with the program objectives. If each objective is covered by at least one question, the questionnaire meets the basic criterion of validity. [Ref. 20]

4. Contingency Variables

Instead of measuring variables before and after the training course or using control groups to see if any improvement occurred as a result of the training, Clement and Aranda decided to look at variables beyond the training course. [Ref. 21] These variables, referred to as "contingency" variables, include the organizational setting within which the manager attempts to use the training, the nature of the manager to be trained, and the nature of the problem to be solved through training.

a. Organizational Influence

Robert House [Ref. 22] identified three factors that affect the transfer of training from the classroom to the job: the formal authority system within the organization; the immediate superior of the trainee; and the primary work group of the trainee. The first factor refers to the possibility that top management has established company policies and objectives. Any training that does not comply with those pre-existing standards will not succeed. The second factor, the supervisor, has a tremendous impact as to whether or not the trainee implements any of the new ideas. If the immediate supervisor does not agree with what the

trainee was taught, and that supervisor controls the rewards and punishments, then the trainee is not likely to use what he or she has learned. The last factor, the trainee's primary work group, refers to the possibility that the trainee may succumb to the expectations or pressures from his peers and subordinates, which may be inconsistent with training.

All three of the factors listed above can influence a manager's attempt to use the concepts learned in a training course. To ensure that the factors have a positive effect on the trainee, all courses taught should reinforce the policies and practices of upper management and all personnel should be indoctrinated as to what upper management expects of them.

b. The Nature of the Manager Being Trained

All managers differ in their experience, education, abilities, attitudes, and values. Therefore, the training received by each individual, although the same, will have different effects on each person. To determine the change in supervisory attitudes, researchers Hayes and Williams, in a 1971 study, found that attitude change is inversely related to age, seniority, and span of control. [Ref. 23] The study concluded that: "supervisory training programs are more effective when the participants are young, relatively new to supervisory ranks, responsible to a small number of subordinate personnel, and have a short period of total service."

c. The Problem to be Solved Through Training

This contingency variable is concerned with matching the proper training method to the desired training objective. A recent survey of training directors has found that case studies are best for the development of problem-solving skills; programmed instruction for retention of knowledge; and both role playing and sensitivity training for changing attitudes and improving interpersonal skills. [Ref. 24] The success or failure of a particular training program could rest with the type of training technique used.

C. EVALUATION OF MANAGEMENT TRAINING

Adequate evaluation of training in organizations is rarely done. [Ref. 25] Many articles have been written on the topic, but most address the difficulties inherent in the process. For example, negligence on the part of management in defining appropriate evaluation criteria, the difficulty of establishing scientifically matched control groups in field research settings, and that small numbers of trainees makes hypothesis testing and inferential statistical analysis difficult. Additionally, good evaluation is time consuming and expensive; and to compound the difficulties, training administrators cannot come to an agreement on a definition of "good" training evaluation. [Ref. 26]

The evaluation of management training has its own set of inherent problems. One of those is the difficulty in collecting data on "hard" criteria. This lack of "hard" criteria is not unusual in the world of management training where expected outcomes are often not stated or, when specified, are hard to measure. Jackson and Kulp have identified through their research many differences between management and technical performance that might influence evaluation. [Ref. 18, p. 5] These differences are:

- The nature of management training makes it harder to describe, observe, and measure outcomes as compared to technical training.
- Performance standards for management positions are less likely to be defined or agreed upon.
- Management positions tend to deal more with qualitative problem-solving situations whereas technical problems tend to be more concrete.
- Management outputs are harder to judge for quality and often times they are not related to specific tasks.
- Management performance often requires responding to unpredictable, unscheduled events.

Jackson and Kulp have identified other differences between management and technical performance, however, they felt that those listed above were the reasons most likely to influence the evaluation of management training.

D. SUMMARY OF LITERATURE REVIEW

To summarize, the literature reviewed consisted of three main topics: management training, the evaluation of training,

and specific difficulties involved in evaluating management training. Within the first topic, it was determined that future managers will have to learn a new style of management--away from the production oriented, authoritarian style--toward a more market oriented, cooperative style. Additionally, engineers who want to become managers will have to be more people oriented vice technically innovative. To help accomplish this, in-house training should be used. In-house programs allow the organization to develop within the employees the attitudes and values that it feels are most important.

Within the second topic, the evaluation of training, four criteria were developed to help measure the effectiveness of training. The four criteria used were: reaction, learning, behavior, and results. These four variables are incorporated before and after evaluations, as well as with control groups, to help measure whether or not the course was successful. Although it is difficult to meet these standards to prove what is successful because of training and what is successful because of outside circumstances, it is still better to attempt to determine the effectiveness of a training course than to do nothing at all.

Finally, it was determined that management training is not evaluated as often as technical or clerical training. Of the several reasons listed above, the overriding explanation for this is the fact that most management training courses do not

state their training objectives. Those organizations that do state their training objectives, however, do not state them in measurable terms. These two conditions, makes evaluation of management training difficult if not impossible.

III. METHODOLOGY

A. GENERAL

This chapter focuses on the method used in the development and execution of the questionnaire which was used as the primary data gathering instrument for this research. Specific data about NAC's management training program were collected through the use of this questionnaire. Section B discusses the development of the questionnaire. This section describes the survey questions that were designed to determine whether or not the individual's job performance is different as a result of the management training received. Section C discusses how the survey sample was determined. Section D discusses how the data were collected. And lastly, Section E provides recommendations pertaining to this and subsequent questionnaire development.

B. DEVELOPMENT OF THE QUESTIONNAIRE

As identified in Chapter II, there are four criteria used to measure management training: reaction, learning, behavior, and results. [Ref. 18] Due to the time constraints of this study, the only criterion we were able to evaluate was reaction. This was accomplished through the use of a questionnaire. The purpose of the questionnaire was fourfold: (1) to determine the relationship between management training

and job requirements, (2) to determine the satisfaction of trainees with specific management courses, (3) to determine opinions on the relationship between management training received and changes in job performance, and (4) to determine if it is perceived that NAC benefits from the management training the trainees receive.

The questionnaire consists of a combination of closed and open-ended questions. However, to get the best response to the questions, it was determined that the majority of the questions should be open-ended vice closed. Open-ended questions allow respondents to answer freely in their own words and they can be worded in such a way that they either ask the respondent a broad general question or a relatively specific question. Table 5 identifies some additional advantages as well as some disadvantages of administering open-ended style questions. [Ref. 18 p. 22]

Closed questions, on the other hand, are best used for demographic type questions and questions that don't require a specific explanation. Closed questions present respondents with possible responses from which they choose the most appropriate one(s). This type of question can include a wide variety of responses, including multiple choice, matching, rating, ranking, true-false, or yes-no. Table 6 identifies both the advantages and disadvantages to using closed questions. [Ref. 18, p. 22]

TABLE 5

ADVANTAGES AND DISADVANTAGES
OF OPEN-ENDED QUESTIONS

Advantages	Disadvantages
1. Questions can usually be developed easily and quickly.	1. Questions may be difficult to score and analyze because of the variability of the responses.
2. Questions allow a free expression and may pick up information that would be missed in a closed question.	2. Questions usually take more time and effort to complete than closed; result may be lower response rate if respondents can choose not to respond-or in brief, uninformative responses where there is no perceived choice.

TABLE 6

ADVANTAGES AND DISADVANTAGES
OF CLOSED QUESTIONS

Advantages	Disadvantages
1. Can usually be scored and the results analyzed quickly and easily.	1. May miss important information since they limit respondents' options.
2. Can usually be completed quickly and easily and may result in a higher response rate.	

The questions asked on the questionnaire were designed after an initial trip was made to NAC in which 12 engineers from randomly selected departments were interviewed. The

information obtained from the interviewees enabled the researchers to develop a questionnaire that was custom designed for the scientists and engineers employed at NAC. The research questions, identified in Chapter I, can each be linked to one or two specific questions contained within the questionnaire. Research questions number 1 and 2 are answered by survey questions 7 and 8a, and 8d and 9 respectively; research question 3 is answered by survey questions 4, 5, and 8b; and lastly, research question 4 is answered by survey questions 6 and 8c. See Appendix C for a copy of the questionnaire used in this study. The questions in the survey were specifically designed to help evaluate NAC's management training program.

Question 8 from Section II confused some of the respondents. The question asked respondents to rank, from 1-5, how they feel about certain statements. In this questionnaire, 1 stood for strongly disagree and 5 stood for strongly agree. After reading the respondents' answers to previous questions within the survey, it was determined that 4 out of the 75 respondents reversed the ordinal ranking and gave, for example, a one when they really meant to give a five. This problem is considered minor because no more than 5 percent of the respondents committed this error and no other consistent error patterns were noted.

C. SAMPLE

NAC management identified a specific set of management courses that is offered primarily to its scientists and engineers. NAC feels that these 12 courses require special attention because, when compared to other management courses, these are not only more costly but they are attended more frequently as well.

How was the determination made as to who would and who would not be sampled? In order to be chosen, the scientists and engineers had only to meet one criterion; they had to have taken at least one of the management training courses identified by NAC. This criterion, extracted from NAC's historical personnel data base, identified 239 individuals. However, because there is more than one research topic being conducted in this area of management training and training in general at NAC, the list of qualified participants had to be reduced. To eliminate "survey burnout," 28 engineers were dropped from consideration because they had participated in a similar survey approximately two weeks earlier. An additional 12 engineers were dropped because they had taken part in the initial interviews that determined what kind of questions needed to be included in the survey. Lastly, three more were excluded because two of the individuals had retired prior to administration of the questionnaire, and the third individual was erroneously identified as a qualified participant. In addition to the above 43 individuals, another 61 had to be

unexpectedly removed from consideration due to funding constraints for department 200. All eligible engineers from within that department had to be omitted. These reductions eventually pared the list of qualified engineers and scientists down to 135.

D. DATA COLLECTION

Initial plans called for all the survey participants to complete the questionnaire in a conference room on NAC premises. The participants were to be assigned into groups of 30 and each group given 30 minute blocks of time to complete the form. However, due to financial constraints, NAC could not allow the 135 participants to take the time off to participate in the study. As a result, the data collection for the questionnaire consisted of the following steps:

1. The researcher visited NAC for the actual administration of the survey.
2. 135 questionnaires were given to the Branch secretaries for distribution.
3. The participants were given two days to complete the questionnaires.
4. At the end of the first day, only 13 questionnaires had been returned.
5. During the second day, a reminder message was sent to each of the participants via electronic mail. A "received message" response was required. The message requested completion of the questionnaire by close of business.
6. At the end of the second day, the researcher had only received an additional 29 questionnaires for a two day total of 42.

7. The following week, another 38 questionnaires arrived in the mail, bringing the total up to 80 questionnaires received.

For reasons of anonymity, and in the hopes of obtaining candid responses, names were not requested on the questionnaires. As a result, not only was there no way to ensure completion of the questionnaires but there was no way to find out who did and who did not return them as well. The final response rate was only 59 percent (80 responses out of 135 surveys).

After analyzing the 80 returned questionnaires, three were rejected because the individuals had critiqued the wrong course and two more were rejected because the trainees did not attend the class. The analysis was performed with the 75 remaining questionnaires; Chapter IV contains the results obtained from those questionnaires.

E. RECOMMENDATIONS

The recommendations provided here concern the distribution of the questionnaire and are not related to the conclusions and recommendations presented in Chapter V.

Upon completion of the survey, one problem area was encountered pertaining to the distribution of the questionnaire. If at all possible, the individuals involved should be administered the questionnaire in a controlled environment. The definition for controlled environment in this case means two things: (1) the researcher should go to

the command/organization where the questionnaire will be administered, and (2) the participants need to be gathered together in a single location; either in one large group or in many small groups.

There are two reasons why the researcher should opt for a controlled environment. The first reason is to get a higher response rate. The simple fact is, a "captive" audience is more likely to respond to the questionnaire. Additionally, employees perceive the survey as important because work time is provided for the questionnaire to be completed. [Ref. 27] Secondly, the researcher of the questionnaire is available should any questions arise. This is important because it will ensure that any confusion about the questionnaire will be clarified and better survey data will be generated.

IV. RESULTS

A. OVERVIEW

The primary focus of this research is to determine: (1) if the trainees are receiving management training that is relevant to their job requirements; (2) if the trainees are satisfied with the specific management courses; (3) if there is a perceived relationship between the management training received and changes in job performance; and (4) if there are any benefits that NAC receives as a result of the management training. In answering these four points, this chapter presents a synopsis of the responses based on the data obtained from the questionnaires. These responses only concern the data received from the twelve management courses that NAC wanted examined. The remainder of this chapter consists of two sections. Section B is an analysis of the demographics of the scientists and engineers who responded to the questionnaire and Section C provides the results obtained from the survey data and conclusions.

B. SURVEY RESPONDENTS

As noted in the last chapter, the number of NAC employees who had taken the management courses of interest in the last year and a half was small. The number decreased even further due to the methodological difficulties described. As a

result, the validity of these results can be questioned. Under these circumstances, a characterization of the survey respondents is appropriate. By comparing respondents to the population of all who could have responded, and to the population of all NAC scientists and engineers, information is added about the representativeness of these data. These comparisons are made below.

Table 7 identifies, by course, the percentage of surveys returned compared to how many people had actually taken the course. The purpose of Table 7 is to point out that the conclusions being drawn from the data may not be representative of the population of all those who have taken these courses. Although four of the twelve courses obtained a return rate of 50 percent or higher, they are still not practically significant because the initial number of eligible participants was quite small. Additionally, the first three courses, Basic Project Management, Dale Carnegie, and Performance Feedback all had a large number of eligible participants but the response rate to the questionnaire was very low. With these limitations, these data should be considered exploratory in nature.

The data obtained from the questionnaire will provide to NAC a profile of the type of personnel who responded to the management training questionnaire. The specific areas of interest are: gender, years worked at NAC, paygrade,

TABLE 7

PERCENTAGE OF PERSONNEL ELIGIBLE
TO RESPOND COMPARED TO THOSE
THAT ACTUALLY RESPONDED

COURSE	ELIGIBLE TO RESPOND	ACTUALLY RESPONDED	PERCENT
Basic Project Management	124	38	31
Dale Carnegie Effective Speaking	29	10	34
Performance Feedback	36	6	10
Power of Effective Listening	14	5	36
Train the Trainer	7	4	57
Managerial Communications Skills	7	4	57
Supervisory Institute	25	3	12
Dealing with Difficult People	4	1	25
Valuing Diversity	14	1	10
Assertiveness Skills	7	1	14
Teambuilding	2	1	50
Statistical Process Control	1	1	100

department currently working in, and lastly, supervisory experience.

The first area to be considered is gender. According to the data, 8 percent of the scientists and engineers who answered the questionnaire were females and 92 percent were males. Within the organization as a whole, women represent 13 percent of the scientists and engineers.

As anticipated, the majority of the trainees who responded, 61 percent, have worked at NAC for ten years or less and 83 percent have not been formally designated as a supervisor. This makes sense because management training is intended mostly for those employees who are inexperienced in supervisory skills and relatively new to the organization. [Ref. 13]

Related to the two demographics above is the third area of consideration--paygrade. There is a direct relationship between an individual's paygrade, number of years worked, and supervisory experience. In other words, if the individual is a GS-11, chances are that the trainee is not a supervisor and has only been at NAC for 10 years or less. The data show that 74 percent of the trainees who participated in the study are between the grades of GS-9 and GS-12; within the NAC organization as a whole, 77 percent of the scientists and engineers are between those two grades.

The distribution of research participants by department shows that departments 800 and 900, together, make up approximately 56 percent of the scientists and engineers within NAC. The next closest department, department 200, only

makes up 15 percent. The survey respondents from departments 800 and 900 accounted for 81 percent of the study participants.

C. ANALYSIS

Since Basic Project Management and Dale Carnegie received response rates of over 30 percent, they will be analyzed in detail. The analysis of those courses addresses the four research questions identified at the beginning of this chapter. The remaining courses are analyzed as a group and will not specifically answer the four research questions. For both the detailed analysis and the group analysis, the numerical scores given to questions 8a-8d will be totaled individually by course. That total will then be divided by the number of respondents from each course and reported in the form of an average score. Question 8 was rated on a scale from 1-5 where one is "strongly disagree" and five is "strongly agree." An average score of five is considered a perfect score and corresponds directly to "strongly agree."

In analyzing the open-ended questions--questions 4, 5, and 6--a content analysis was conducted. As part of the analysis, the major themes, given by the respondents, were drawn from each question. The answers were then grouped according to theme.

1. Objective One

The first objective of this study is to determine if the trainees are receiving management training that is relevant to their job requirements. This question can be mapped to survey questions 7 and 8a.

Question 7: Have you had any difficulty in applying anything you learned in the course to your job? If yes, why?

Course: Basic Project Management

	<u>N</u>	<u>%</u>
a. No.....	22	58
b. Yes.....	16	42
c. Of yes responses:		
1) N/A to current job.....	8	50
2) No time to implement.....	6	38
3) Misc.....	2	12

For this course, almost half of the respondents said that they did have difficulty in applying what they learned to their job. The two most frequently mentioned reasons were that the course was not applicable to their current job and that they were too busy to try the new process.

Course: Dale Carnegie Effective Speaking

	<u>N</u>	<u>%</u>
a. No.....	8	80
b. Yes.....	2	20
c. Of yes responses:		
1) Difficult to implement.....	2	100

Although this course has few responses, they do represent 34 percent of the population that has taken the class. What is significant to note here is that 80 percent of the respondents indicated that they did not have trouble implementing what they learned to their jobs.

Question 8a: This course was relevant to my job, i.e., it addressed problems and issues I encounter in my job.

<u>Course</u>	<u>Avg.</u>
Basic Project Management (BPM)	3.92
Dale Carnegie Effective Speaking (DC)	4.20

The results show that the trainees thought that the DC course was more relevant to their jobs than the BPM course.

The extreme numbers that make up the averages for the BPM and DC courses are: 3 ones and 13 fives for BPM and 1 one and 6 fives for DC. It should be pointed out however that the one that was given to the DC course, in all likelihood, should have been a five. After reviewing all of this respondent's answers, it was felt that he reversed the scale for this question because the answers given were not consistent with the rest of his responses to the survey. With a five instead of a one, the average for this question increases to 4.60. This problem with the reversed scale will persist for the Dale Carnegie course throughout question number 8.

2. Objective Two

The second objective of the study is to try to determine if the trainees are satisfied with the specific management courses. To help achieve this objective, survey questions 8d and 9 were developed.

Question 8d: Overall, I was satisfied with this course.

<u>Course</u>	<u>Avg.</u>
Basic Project Management.....	4.03
Dale Carnegie Effective Speaking.....	4.30

The averages here indicate that the participants agreed with the statement. However, the participants of the DC course agreed somewhat more strongly because there was not one instance of a rating below four. With the reversed scale problem corrected, the average for DC would be 4.7.

Question 9: Should NAC continue to offer this course?

<u>Course</u>	<u>N</u>	<u>% Yes</u>
Basic Project Management (BPM).....	38	97
Dale Carnegie Effective Speaking (DC).....	10	100

This question and question number 8d are very similar. With high averages received for question 8d, it was anticipated that high percentages would follow for this question. For BPM, only one person out of 38 answered this question negatively. His complaint was that the course did not teach him how to manage a project. All of the respondents of the DC course indicated that NAC should continue to offer this course.

3. Objective Three

The purpose of this objective is to determine if there is a perceived relationship between the management training received and changes in job performance. This objective is related to questions 4, 5, and 8b in the survey.

Question 4: Describe any non-observable ways you have changed as a result of this training, for example, in your thinking, level of understanding, attitude, etc.

Course: Basic Project Management

	<u>N</u>	<u>%</u>
a. Increased understanding.....	17	45
b. Better time utilization through planning and organization, e.g., cut down on overtime.....	11	29
c. None.....	6	16
d. Misc (Improved attitude, Better customer relations).....	4	10

After content analyzing the responses to this question, it was determined that 84 percent of the participants reported positive non-observable changes whereas only 16 percent of the participants reported no non-observable changes. Of those that reported gains, 66 percent reported better understanding and improved attitude and 34 percent reported improved results on the job. Of the six respondents that reported no non-observable changes to this question, two were "directed" to take the course and (probably as a result) reported negatively on nearly every question in the survey.

Course: Dale Carnegie EEffective Speaking

	<u>N</u>	<u>%</u>
a. More open-minded, improved attitude, accepting of other viewpoints.....	6	60
b. Improved communications/interpersonal skills.....	2	20
c. Improved self-confidence.....	2	20

All ten participants reported positive non-observable changes as a result of the training. Sixty percent of the participants felt that the course improved their attitudes or that they had become more open-minded.

Question 5: Describe any behavioral ways you have changed as a result of this training: what do you do differently now on your job as a result of having taken this course?

Course: Basic Project Management

	<u>N</u>	<u>%</u>
a. Better organized/structured.....	15	39
b. None.....	10	26
c. Better at planning.....	4	11
d. Integration of "big picture" data, more responsive.....	4	11
e. Better at customer/peer relations.....	2	5
f. Too busy to apply what was learned.....	1	3
g. Misc.....	2	5

Seventy one percent of the trainees reported positive changes as a result of the training they received, whereas only 29 percent indicated negative or no changes. Five of the ten participants that indicated no change, were the same individuals that indicated no change for the previous question. However, in this case, only one of the participants was "directed" to take the course.

Course: Dale Carnegie Effective Speaking

	<u>N</u>	<u>%</u>
a. Better at working w/ people.....	7	58
b. Better presentations.....	2	17
c. More assertive.....	2	17

d. More positive.....1 8

For this question, a total of 12 responses was received from ten participants, i.e., at least one of the participants made more than one response to the question. As can be seen from the above responses, all trainees reported a positive improvement in their behavior after the training. At 58 percent, working better with people was the response most often mentioned.

Question 8b: This course met the objectives of improving my abilities in this area.

<u>Course</u>	<u>Avg.</u>
Basic Project Management.....	3.71
Dale Carnegie Effective Speaking.....	4.90

The average for BPM is the lowest received thus far. However, the participants still leaned more toward agreeing with the statement than toward being neutral. The high average received for the DC course indicates that almost the entire sample strongly agreed with the statement. The actual numbers for DC were 9 fives and 1 four. This average takes into account the reversed scale problem.

4. Objective Four

The purpose of this question is to determine if there are any benefits that NAC receives as a result of the management training. The data received from survey questions 6 and 8c provide data relevant to this question. Question 6

asks the respondent to consider how his/her observable and non-observable changes have benefitted NAC, if at all.

Question 6: Please consider your answers to questions 4 and 5 and describe how you think these training outcomes have benefitted NAC.

Course: Basic Project Management

	<u>N</u>	<u>%</u>
a. Working more efficiently.....	18	47
b. Improved response time, more competition, lower costs.....	9	24
c. Better communication/coordination.....	7	18
d. Better manager/engineer.....	6	16
e. None.....	6	16

Sixteen percent of the respondents said that NAC did not benefit from the training they had taken. The rest of the participants indicated that NAC did, in fact, benefit from the training they received. Of the remaining 84 percent, which consisted of 40 responses by 36 people, 45 percent said that NAC was more efficient as a result of the training received. Additionally, 22 percent said that the customers of NAC were receiving the benefit in the form of lower costs and improved response time. An Interesting note is that there was a least one person in each of the first three categories that reported no observable benefits in question 5, yet they still felt that NAC benefitted from them taking the training. Additionally, one respondent who was extremely satisfied with the course felt that the course should not be recommended for new engineers or technicians. This question received eight more

responses than it had participants. This is due to several of the participants who gave multiple responses to the question.

Course: Dale Carnegie Effective Speaking

	<u>N</u>	<u>%</u>
a. Better representation of NAC with sponsor.....	4	40
b. Working better with other employees.....	7	70
c. Misc.....	1	10

Once again, as has been the case with the DC course, a high percentage (in this case 100 percent) of the trainees indicated that their training has benefitted NAC in a positive manner. As indicated above, this course also received more responses than participants and this is also the result of multiple responses from two participants.

Question 8c: NAC has benefitted from the management training I received.

<u>Course</u>	<u>Avg.</u>
Basic Project Management.....	3.66
Dale Carnegie Effective Speaking.....	4.80

This question asks for the same information as number 6. The redundancy was built into the question to see if the respondents were being consistent with their answers. Upon comparing the two questions, it was determined that the respondents were being consistent. A somewhat lower positive response rate for both questions 6 and 8c was recorded for BPM. Whereas, an almost perfect positive response rate was recorded for DC. For the DC average, the reversed scale problem has already been adjusted.

5. Summary

a. Basic Project Management

The data revealed that 100 percent of the engineers taking this course had not been formally designated as a supervisor. This includes those who were not designated and had not supervised other persons during the past year (58%), and those who were not designated but had supervised other persons during the past year (42%). Additionally, 95 percent of the engineers who took this course were either GS-11s or 12s.

Results of the course content evaluation show that 42 percent of the engineers are having difficulty applying what they learned in the class to their job. However, in spite of that difficulty, 37 of the 38 respondents indicated that NAC should continue to offer this course. This number includes five individuals who said that they were "directed" to take the course. A possible reason for this disparity is that although the material being presented is applicable to their jobs, the trainees are not yet in the position where they can put to use what they learned. The reason given by the one person who thought that the course should not be continued at NAC was that it did not teach the trainees how to manage a project. However, this one negative statement is countered by approximately 37 other positive statements.

b. Dale Carnegie Effective Speaking

The engineers that took this course had the same basic characteristics as the engineers that took Basic Project Management. Not only had 100 percent of these engineers not been formally designated as supervisors, but they were also all GS-11s or 12s. All ten respondents gave positive comments and indicated that the course should be continued. Many of those same trainees also indicated that this was the best training that they had received.

6. Remaining Courses

Since the remainder of the courses had such small response rates, they will be looked at concurrently and any significant findings will be identified. The first questions to be analyzed are questions 8a-d. To review, question 8a measured the relevance of the training to the job, 8b was designed to measure whether or not the training improved abilities in that specific area, 8c identified if NAC benefitted from the training, and 8d determined if the employees were satisfied with the course. Table 8 identifies the ten remaining courses as well as the average of the responses to each question.

Other than Valuing Diversity, all the other courses have averages that indicate positive attitudes toward the training received. However, the last five courses only had one respondent and are therefore considered to have limited

TABLE 8
AVERAGED RESPONSES TO QUESTION 8

Course	#	Q 8a	Q 8b	Q 8c	Q 8d
Performance Feedback	6	4.67	4.17	4.17	4.00
Power of Effective Listening	5	4.00	4.00	3.00	3.20
Train the Trainer	4	4.75	4.25	4.25	4.25
Managerial Communication Skills	4	4.50	4.00	4.50	4.50
Supervisory Institute	3	4.67	4.67	4.67	4.67
Dealing w/ Difficult People	1	4.00	4.00	4.00	4.00
Valuing Diversity	1	1.00	1.00	1.00	1.00
Assertiveness Skills	1	5.00	4.00	4.00	4.00
Teambuilding	1	5.00	4.00	5.00	4.00
Statistical Process Control	1	3.00	4.00	4.00	5.00
Combined Average	27	4.01	3.81	3.92	3.86

reliability. Overall, as can be seen from the combined averages in the last row of Table 8, the respondents felt that 1) the courses were relevant to their jobs, 2) they improved their abilities in that area, 3) NAC benefitted from the training, and 4) satisfied with the course.

a. Performance Feedback

The individuals who took this course were people who had worked at NAC for more than 11 years, were either a GM-13 or 14, and had been a designated supervisor from somewhere between one to ten years. Some of the positive gains reported from the course were that they are now better at interviewing and that they provide feedback more frequently. Of the six respondents, two were required to attend and of those two, only one answered negatively to the questions. The negative respondent, when asked if NAC should continue to offer this course, said no because he felt that the course should only be offered to new supervisors. However, both respondents were consistently responsible for giving the lowest scores as their answers to question number eight. Instead of strongly agreeing that the course was relevant to the job, these two respondents only agree with the statement. Additionally, they were neutral as to the course improving their abilities in that area and to their overall satisfaction level.

b. Power of Effective Listening

Of the responding sample of participants who have taken this course, the majority of the personnel were GS-12s and GM-13s who had been working at NAC for approximately 6-10 years. The averages from the above table indicate a course that is only somewhat effective, receiving the lowest combined

averages in three of the four questions (excluding Valuing Diversity). The respondents thought the course was quite relevant, were fairly positive that it improved their ability, felt less confident that NAC benefitted, and felt even less satisfied. However, one of the survey respondents was required to take the course and it is the responses from that individual that brought down the averages. Additionally, all of the respondents, except the individual that was required to take the course, had positive comments about the training; e.g., improved concentration, better communication, and improved efficiency.

c. Train the Trainer

Four engineers responded to this survey. All of their responses to the questions were positive except for one comment. One individual indicated that the course did not teach instruction methods, the primary purpose for taking the course. From the rest of the participants, a sampling of their responses are: the course gave them more confidence in their teaching skills, it made them more conscious of body language, and it benefitted NAC by making the participants more organized and more effective as instructors. The respondents are GS-12s and GM-13s that are not formally designated supervisors, and the majority of which, three out of four, have been employed at NAC for over 20 years.

d. Remaining Courses

Of the seven remaining courses, six consisted of positive comments about training. However, due to the small number of responses received, no significant conclusions can be obtained that would be relevant to the analysis.

V. RECOMMENDATIONS AND SUMMARY

A. RECOMMENDATIONS

Based on the data analyzed in this study, the following recommendations are made:

1) NAC should continue to systematically collect these same kinds of data both immediately after people have taken the course as well as 6-12 months later.

2) NAC should design and implement a training evaluation program to allow for a more comprehensive review of the courses being taught--if not for all the courses, then at least for the courses with high through-put and/or cost.

3) NAC should conduct a cost benefit study of several of the courses evaluated in this study.

1. Recommendation 1

This recommendation will give NAC a more accurate picture of how representative these data are and if the employees truly value these particular courses. This is probably the simplest and least expensive method of evaluating training but it is also the least effective. Simply measuring whether or not an individual liked the training does not indicate whether anything was learned. This evaluation would measure reaction data, in part, but as with this study, it should attempt to go further by assessing perceptions of learning, behavior, results, and relevance. By asking these questions after a period of time has passed, it will thus eliminate the potential positive bias that can result from

good feelings in the course. In this way, NAC can find out the trainees' perceptions of what really happens when they apply what they learn in the course to their jobs.

2. Recommendation 2

Recommendation Number 2 would require more effort but will be of more benefit to NAC. The suggestions listed below, if followed, should lead NAC to a more effective system for evaluating their training program.

a. At a minimum, NAC should test the participants both before and after every course of instruction. This would help the training director in determining how much each of the participants have learned individually. Additionally, control groups should be used whenever possible. This would help in determining whether the training was the cause of the increase or whether good mentoring or on-the-job experience was responsible for the increase.

b. The next step, after step one is successfully implemented, is to measure behavioral changes. This step is more difficult. Changes in behavior do not take place over night and they do not occur simultaneously for all individuals. To measure changes in behavior, the trainees' supervisor, with input from the training director, must measure behavior before and after the program. Two things should be remembered: 1) allow enough time after the training for the change to occur, and 2) measure it several times to be

sure that the measurement is accurate. As in step one, use a control group whenever possible. Many factors can contribute to a change in behavior; raises or decreases in salary, attitude of the supervisor, or peer pressure from fellow employees. Without a control group, the training director would not be able to distinguish between changes due to the training or changes due to outside influences.

These guidelines, which were developed by Donald Kirkpatrick, were outlined in Chapter II of this study. They offer a reliable but often-times difficult means of evaluating training. Recommendation Number 2 offers the ideal type of evaluation and is the most difficult to implement. As a result, most organizations don't do this much evaluation. However, just because it may difficult does not mean that the evaluation should not be attempted. In the current fiscal climate it becomes increasingly important to do what you can to demonstrate the value of training. As noted by Jackson and Kulp, however, [Ref 18] getting a little bit of data is better than getting nothing at all.

3. Recommendation 3

The third recommendation is an attempt to determine whether it is worth NAC's time, money, or effort to continue offering several of their courses. The training records indicate that seven of the twelve management training courses evaluated had fewer than eleven participants take the course

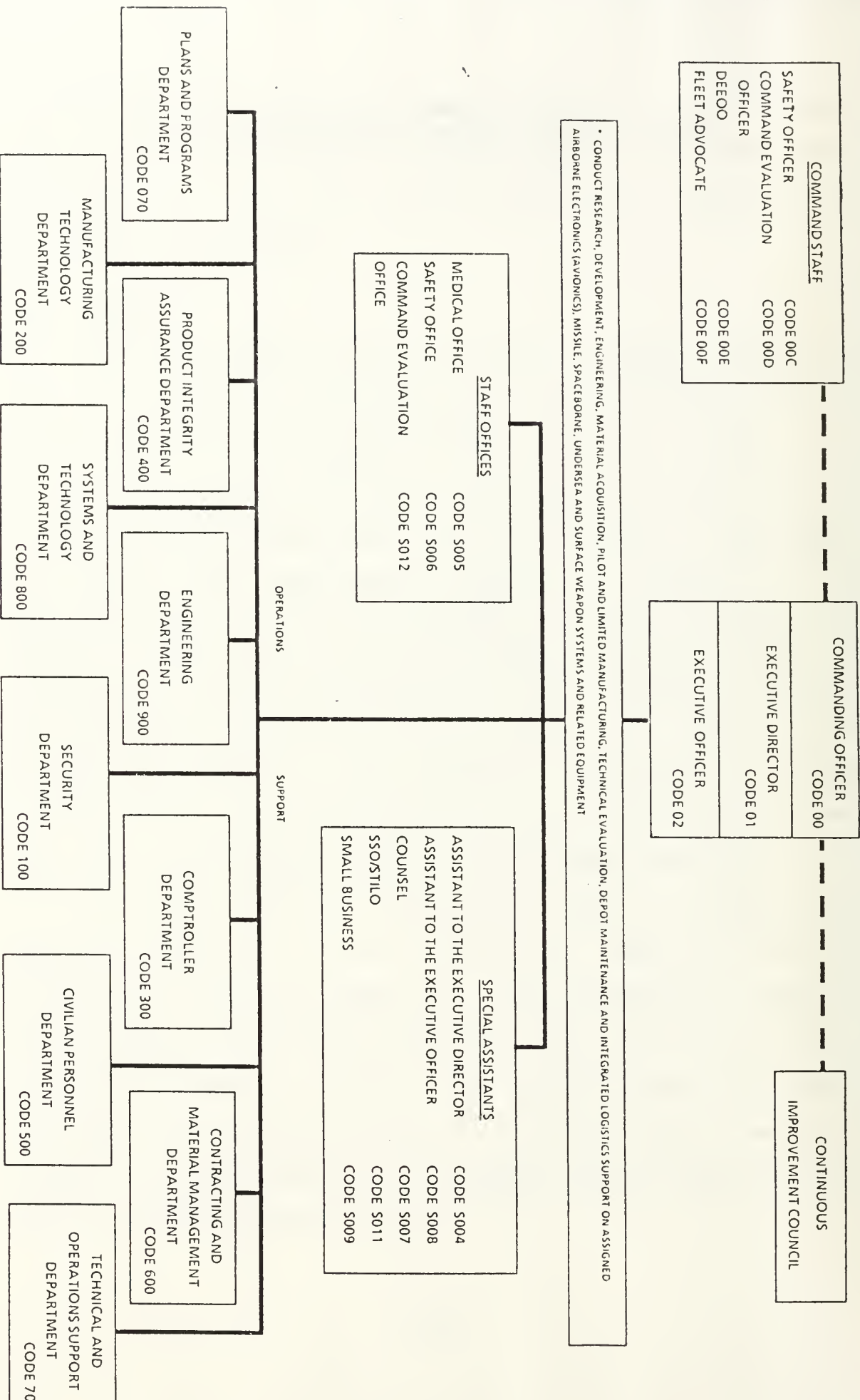
in the last year and a half. Is it worth NAC's time and money to give a course to such a small portion of their scientists and engineers? The only way to know for sure is to conduct a cost benefit analysis.

B. SUMMARY

The main purpose of this study was to determine whether or not the management training program being offered by NAC to their scientists and engineers was perceived as beneficial. In order to find the answer to this question, four research questions were identified: 1) How relevant is management training to job requirements according to trainees; 2) How satisfied are trainees with specific management courses; 3) What is the perceived relationship between management training received and changes in job performance; and 4) What are the potential benefits of the management training for the NAC organization? A survey, with the above questions incorporated into it, was developed to help answer those questions.

The results of the survey indicated that the trainees had positive responses to all of the above questions with the exception of question number one. This question was answered negatively 42 percent of the time for one course only: Basic Project Management. All of the other courses for this question were answered positively. However, due to the small number of surveys returned, the results for the entire study must be considered exploratory.

APPENDIX A
NAVAL AVIONICS CENTER ORGANIZATIONAL CHART



APPENDIX B

MANAGEMENT COURSES AVAILABLE TO NAC PERSONNEL

The following is a list and short description of the courses available to NAC managers and management development candidates who would like suggestions for their IDP:

1. AMA Self-Study Courses

- General Management Skills
- Marketing Management
- Management and the Computer
- Manufacturing Management
- Managerial Finance and Control

2. Supervisory Development (parts I and II)

Part I

- Motivating the Average Employee
- Improving Performances, Work Habits, and Attendance
- Maintaining Improvement
- Taking Disciplinary Action
- Handling Employee Complaints

Part II

- Establishing Goals and Objectives
- Effective Delegation
- Interviewing and Selection
- Giving Bad News
- Managing Change
- Time Management

3. Supervisory Institute (three day course)

Day 1

- Leadership Styles
- Transition to Supervision
- Performance Standards/Appraisals
- Enhancing Employee Motivation

Day 2

- Communications: Assertiveness, Praise, and Constructive Criticism

- How to Delegate Effectively
- Affirmative Action/EE0: Impact on Supervisors
- Nonverbal Aspects of Communication

Day 3

- Managerial Aspects of Supervision
- Setting Goals and Objectives
- Personal Strategies for Working Smarter, Not Harder

4. **Advanced Management Workshop**-Builds on concepts and skills introduced in both the "Supervisory Institute" and the "Supervisory Development" courses. Develops skills in:

- Leading Group Process
- Creative Problem Solving and Decision-Making
- Negotiation
- Interviewing
- Conducting Effective Meetings
- Managing Change

5. **IUPUI Public Management Institute Seminars**

- Making Effective Presentations
- Teambuilding
- Making Meetings More Productive
- Meaningful Resolution of Conflict
- The Power of Effective Listening
- Advanced Management

6. **Evening classes at University of Indianapolis (most are AMA accredited)**

- How to Plan and Run Productive Meetings
- Assertiveness Skills for Career/Personal Success
- Getting Results with Time Management
- How to Build Effective Work Teams
- Personal Strategies for Managing Stress

7. **AMA seminars**

- Improving Managerial Skills
- Leadership Skills for New Managers
- Time Management
- Assertiveness Training
- Writing, Speaking, and Listening for Successful Communication
- And Approximately 90 more

8. OPM Federal Executive Seminars and the Army's Personnel Management for Executives course (two week seminars)
- Seminar for New Managers
 - Management Development Seminar
 - Managerial Competencies for Executives
 - Executive Development Seminar
 - Managing Money and Material Resources
9. Indiana Business Seminars (IU School of Business--three day seminars)
- Improving Management Skills
 - Managing Writing for the Communication Age
 - Production Management
 - Statistical Process Control
10. AMA's "Management Course" (IU). Taking three of the four units will satisfy much of the MDP requirement.
- Unit 1, Focusing on Results: Key Management Actions
- Organizational Growth
 - Strategic Planning
 - Team Planning Process
 - Creativity and Teamwork
- Unit 2, Using Analytical Tools: Financial Planning and Management
- Profitability
 - Managing the Profit Center
 - Measures of Performance
 - Break-Even Point Analysis
- Unit 3, Leading Your People: Manager's Role as Leader and Motivator
- Executive Leadership
 - Delegation
 - Negotiation Skills
 - Selection and Interviewing
 - Performance Appraisal
- Unit 4, Strategic Marketing Management: Competing Successfully and Satisfying Customers
- Strategic Thinking
 - Dealing with Competition
 - Customer Satisfaction and Quality
 - Quality Management

This inventory of available courses is not an all inclusive list, and employees are not limited to just these courses. Since every worker has different educational ideas and goals, employees are encouraged to work closely with their supervisors in order to develop a plan that best fits their own needs.

APPENDIX C

MANAGEMENT TRAINING QUESTIONNAIRE

NAC SCIENTIST AND ENGINEER TRAINING SURVEY

Dear Survey Participant:

Thank you for your willingness to participate in the survey of Scientist and Engineer Communities at the Naval Avionics Center (NAC). This survey is part of an ongoing study sponsored by NAC's Personnel Department to improve its customer service. Participation such as yours will assure that all viewpoints are reflected in the conclusions and recommendations resulting from the study.

The main purpose of the study is to obtain individual perceptions of management training from those receiving the training, i.e., scientists and engineers. It is an opportunity to register your observations, concerns, and satisfactions on a number of training-related topics and issues. This survey will allow us to see how the scientist and engineer communities feel about these issues.

The following questionnaire was custom designed for NAC. A few questions cover standard demographic characteristics questions which help us with the statistical analysis of the data. But most of the items reflect issues of specific concern to NAC as identified through interviews.

All responses will be held in complete confidentiality, so please be frank and honest in your answers. The questionnaires will be administered and collected by a member of the Naval Postgraduate School. Your answers will be combined with others so that no individual responses will be reported or made available to anyone.

The survey should take about 30 minutes to complete. Once the data are analyzed, a report of findings will be prepared and made available to all interested personnel through Department 500.

Thank you for your cooperation.

//

Naval Postgraduate School

Naval Postgraduate School

GENERAL SURVEY INSTRUCTIONS

The following information is needed to help us with the statistical analysis of the data. All of your responses are **STRICTLY CONFIDENTIAL**; no individual responses will be reported. Data will be aggregated and average ratings calculated. This information will allow comparisons to be made among different groups of employees.

In responding to the questions in this survey, we ask that you consider only NAC-sponsored on-site or off-site management training courses. We do not want responses which make reference to mandatory-type administrative classes which everyone is required to attend (i.e., safety, CPR, sexual harassment, etc.).

Most of the questions in this survey will ask about your perceptions of the training you've received. These will be open questions which allow you to formulate your own answers.

The survey is broken down into 2 sections:

<u>SECTION</u>	<u>EXPECTED COMPLETION TIME</u>
SECTION I - DEMOGRAPHICS	3 - 5 MINUTES
SECTION II - MANAGEMENT TRAINING	15 - 20 MINUTES

The entire survey should take between 20 and 30 minutes, depending upon the length of your responses.

Again, thank you for your cooperation.

SECTION I - DEMOGRAPHICS

PLEASE CIRCLE THE LETTER BESIDE THE APPROPRIATE RESPONSE FOR EACH QUESTION OR WRITE IN THE CORRECT INFORMATION.

1. Are you: a. Male b. female
2. How many years have you worked at NAC?
 a. under 1 b. 1 - 5 c. 6 - 10
 d. 11 - 15 e. 16 - 20 f. over 20
3. Your paygrade is? GS/GM - _____
4. What is your job series number (e.g., 0855 for Safety Engineer)? _____
5. What department/division/branch do you work for?
 Dept: _____ Div: _____ Br: _____
6. What is your supervisory experience?
 - a. I am not a formally designated supervisor and I have not supervised other persons during the past year.
 - b. I am not a formally designated supervisor but I have supervised other persons during the past year.
 - c. I have been a formally designated supervisor for less than 1 year.
 - d. I have been a formally designated supervisor for 1 to 5 years.
 - e. I have been a formally designated supervisor for 5 to ten years.
 - f. I have been a formally designated supervisor for more than 10 years.

SECTION II - MANAGEMENT TRAINING

PLEASE CIRCLE THE LETTER BESIDE THE APPROPRIATE RESPONSE FOR EACH QUESTION OR WRITE IN THE CORRECT INFORMATION. BE AS SPECIFIC AS POSSIBLE.

1. Course Title. _____

2. About how many months has it been since you have had this training?

- | | | |
|------------|------------|------------|
| a. under 1 | b. 1 - 3 | c. 4 - 6 |
| d. 7 - 9 | e. 10 - 12 | f. over 12 |

3. Why did you take this course?

4. Describe any non-observable ways you have changed as a result of this training, for example, in your thinking, level of understanding, attitude, etc.

MANAGEMENT TRAINING

5. Describe any behavioral ways you have changed as a result of this training: what do you do differently now on your job as a result of having taken this course?

6. Please consider your answers to questions 4 and 5 and describe how you think these training outcomes have benefitted NAC.

7. Have you had any difficulty in applying anything you learned in the course to your job?

a. No

b. Yes (If yes, why?) _____

MANAGEMENT TRAINING

READ EACH STATEMENT CAREFULLY AND THEN CIRCLE YOUR ANSWER
ACCORDING TO THE FOLLOWING SCALE:

- 1--Strongly Disagree--I strongly disagree with the statement
- 2--Disagree--I disagree with the statement, but not so strongly
- 3--Neutral--I am neutral toward the statement
- 4--Agree--I agree with the statement, but not so strongly
- 5--Strongly Agree--I strongly agree with the statement

8. How do you feel about the following statements?

- a. This course was relevant to my job,
i.e., it addressed problems and
issues I encounter in my job.-----1 2 3 4 5
- b. This course met the objectives of
improving my abilities in this area.-----1 2 3 4 5
- c. NAC has benefitted from the management
training I received.-----1 2 3 4 5
- d. Overall, I was satisfied with this
course.-----1 2 3 4 5

PLEASE CONSIDER ONE LAST QUESTION:

9. Should NAC continue to offer this course?

- a. Yes
- b. No (If no, why not?) _____

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